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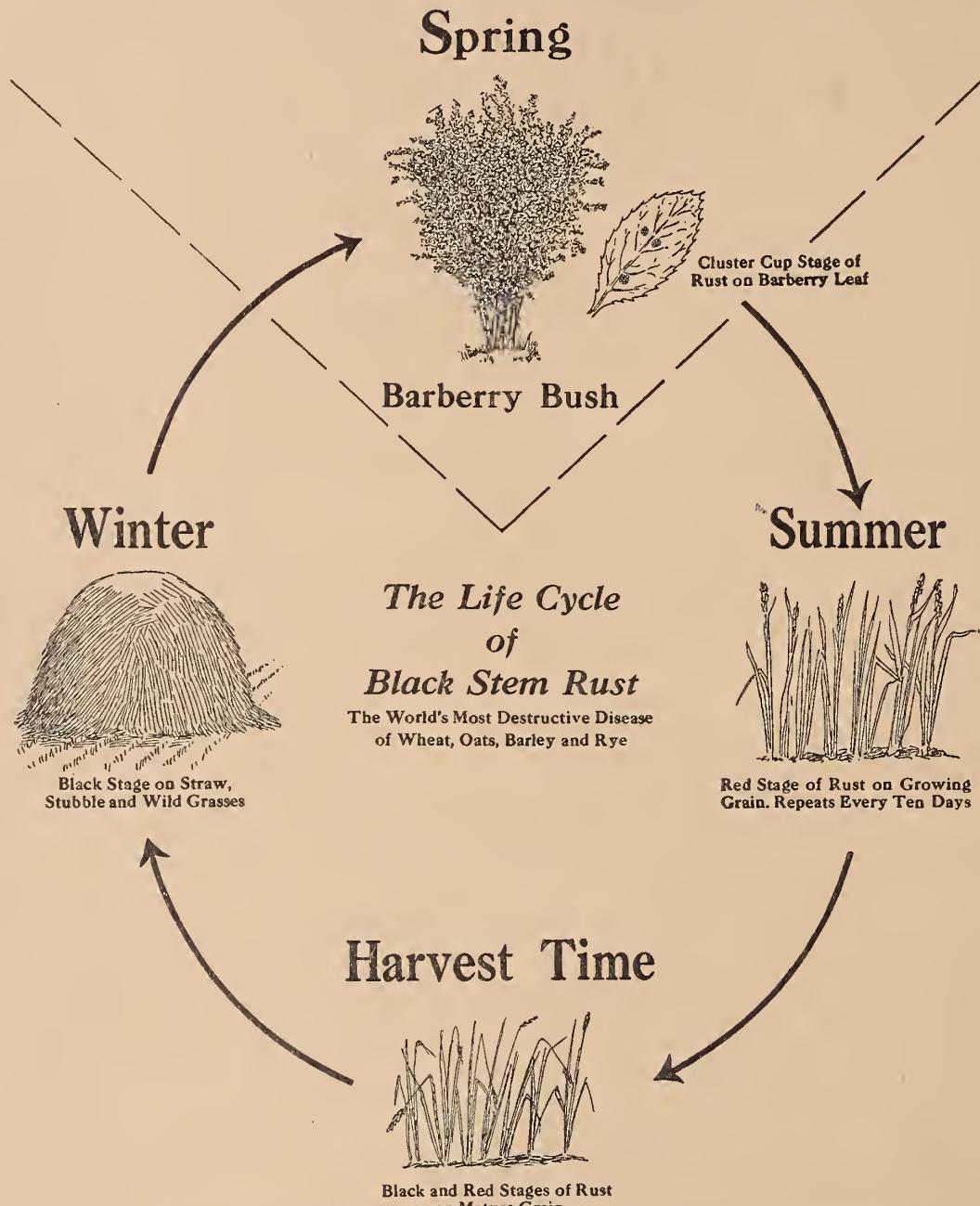
PROGRESS  
*of the*  
Barberry Eradication  
Campaign  
*in*  
NORTH DAKOTA in 1929



*Our Grain Crops Must Be Protected from Black Stem Rust*

*Barberry Eradication Pays*

# Remove the Barberry and Break the Rust Cycle



All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

BOOST BARBERRY ERADICATION—A PRACTICAL RUST  
CONTROL MEASURE

PROGRESS OF THE BARBERRY ERADICATION CAMPAIGN  
IN NORTH DAKOTA, 1929

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United States Department of Agriculture

Introduction

Black stem rust for centuries has been the most destructive disease of small grains. In the writings of Caesar are found references to the "red pestilence" which destroyed the Romans' grain fields. The modern farmer each spring utters a silent prayer that his grain will escape the rust. He does not remain inactive in the face of danger, however. Aided by scientific investigations, the farmer has been fighting this disease of small grains with the result that during the last 10 years the trend of losses from rust has been downward. This has been due in no small part to the barberry-eradication campaign inaugurated in 1917 by the State of North Dakota and sponsored since 1918 by the United States Department of Agriculture, under whose supervision it has been extended into the 13 North-Central wheat-growing States.

Contrary to popular opinion, control of black stem rust by barberry eradication is not a new project. The first step toward an organized movement of this kind is found in a law passed in 1660 in Rouen, France. Laws prohibiting the growth of common barberry bushes within a specified distance of grain fields were enacted in most of the countries of western Europe and the British Isles. During the period from 1726 to 1755 the people of Massachusetts, Rhode Island, and Connecticut passed laws against this offender which their ancestors had brought with them from across the Atlantic. It is significant to note that all these laws were passed merely because spreads of rust from barberry bushes to grain fields were observed, for it was not until 1865 that the real relationship of this bush to black stem rust was definitely proved. In that year De Bary, a German scientist, discovered the life cycle of black stem rust and established its true connection with the barberry bush.

Today the American farmer does not have to fight this battle single handed as did his predecessors, for the United States Department of Agriculture, equipped with scientific knowledge and a well-organized administration, has attacked this problem of stem-rust control. The campaign has made definite

1/ State Leader of Barberry Eradication in North Dakota.

2/ From the beginning of the campaign in 1918 until January 1, 1930, barberry eradication was a project of the Office of Cereal Crops and Diseases, of the Bureau of Plant Industry. On January 1, 1930, the Office of Barberry Eradication was established as a separate unit of the Bureau.

progress. But the fight can not be carried on by a single agency. The farmer and the farmer's neighbor, the people of the towns and cities, must cooperate to make this program successful.

#### Organization and Personnel

The barberry-eradication campaign in this State is supervised by a State Leader under the direction of the United States Department of Agriculture, in cooperation with the Agricultural College, the State Department of Agriculture, and other State and civic organizations. Permanent headquarters for the campaign in North Dakota is maintained at the North Dakota State Agricultural College, Fargo, N. Dak.

#### Cooperating Agencies

It is gratifying to review the cooperation which has been received from agricultural and nonagricultural agencies. In 1922, agricultural and allied interests of the Northwest organized the Conference for the Prevention of Grain Rust with headquarters at Minneapolis, Minn., for the sole purpose of aiding this campaign, and it has rendered invaluable assistance in many phases of the work.

Two years ago the campaign was taken up by the Greater North Dakota Association as one of the projects to receive its active assistance, and it has aided in many ways, as have also the Experiment Station, the Extension Division, and other departments of the Agricultural College. Among other cooperating agencies, the Retail Merchants Association and the State Bankers Association have been prominent because of their activities.

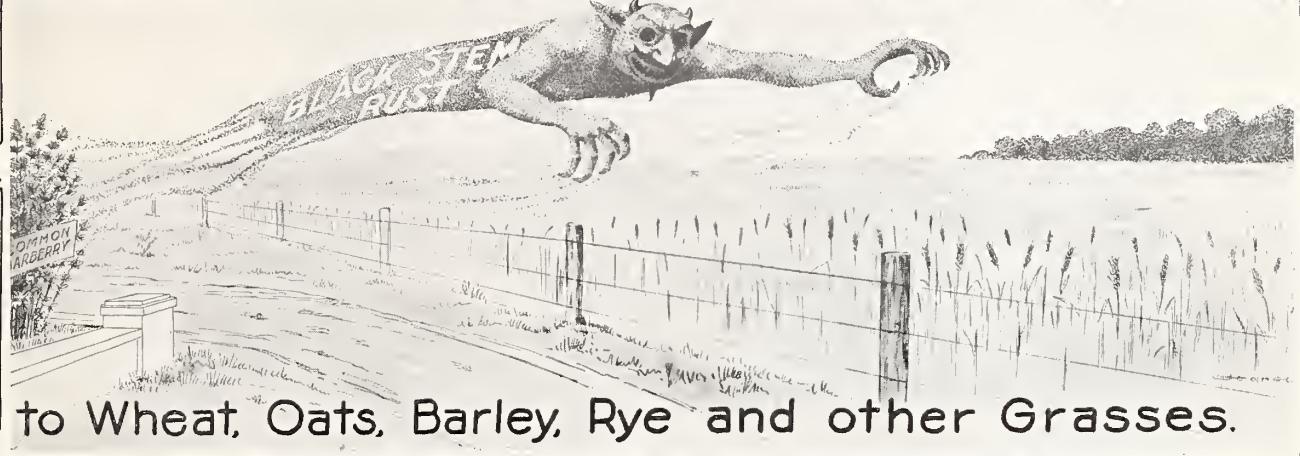
The educational work successfully conducted in the schools has been made possible by the whole-hearted cooperation of the State Department of Public Instruction.

#### Financing

In 1917 the State of North Dakota began the present barberry-eradication campaign by providing a cash appropriation for the work, which was to be supervised by the State Commissioner of Agriculture. The following year the project was taken over by the United States Department of Agriculture. Although the Federal Government has financed most of the work in this State since that time, the State Legislature made two appropriations, one in 1923 and another in 1929.

More than 89 per cent of the funds used in barberry eradication has been furnished by the Federal Government. The remainder has been provided by the State College, the State Department of Agriculture, and various other cooperating organizations.

# BLACK STEM RUST SPREADS FROM COMMON BARBERRIES



to Wheat, Oats, Barley, Rye and other Grasses.

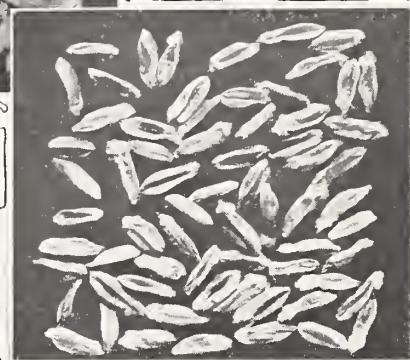
Black Stem Rust as it appears on the leaves of the Common Barberry



Enlarged single leaf



Plump healthy grain



Shriveled rusted grain

## DANGEROUS NEIGHBORS



Common Barberry Bushes growing near grain fields

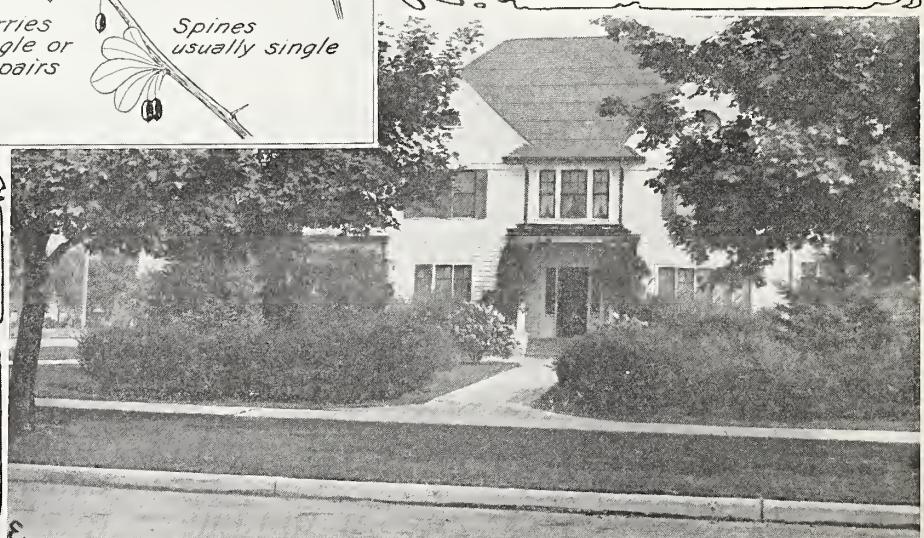


Common Barberry is  
harmful, destroy

Report Common Bar-  
berry bushes you may  
find to your State  
Leader of Barberry  
Eradication.



Japanese Barberry is harmless,  
do not destroy



Summary of Campaign in North Dakota, 1917 - 1928

With the recollection of the rust epidemic of 1904 and the crop failure in 1916, due to a devastating scourge of black stem rust, the farmers of North Dakota outlawed the common barberry in 1917 and the State Legislature appropriated \$5,000 for its eradication. This work was to be supervised by the Commissioner of Agriculture. It is estimated that the people of the State, cooperating enthusiastically in an effort to reduce losses from stem rust, destroyed more than 10,000 common barberry bushes during the first two years of the campaign.

In 1918, when the work was taken over by the United States Department of Agriculture, the campaign was extended to the 13 North-Central grain-growing States, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming.

It was believed then that almost all of the bushes growing in North Dakota would be found in the towns and cities and that only a few would be found in the rural districts. However, the preliminary survey soon showed that there were as many barberry bushes in the rural districts as in the towns, if not more, and the plan of procedure was changed to include an inspection of all farmsteads. Because of war-time demands it was desired to eradicate the greatest number of bushes in the shortest possible time, thereby reducing as quickly as possible the spread of rust infection from the common barberry to the small grain crops. It was possible to locate only the more conspicuous hedges and clumps of bushes. Many bushes were growing in secluded places where they could be found only by an intensive search. The preliminary survey was finally completed in 1924.

In 1923 a local stem-rust epidemic in surveyed territory was traced to common barberry bushes, and in that year a second survey of the State was begun. At the present time surveys are being carried on by the intensive method, insuring that every location having shrubbery, wild or planted, is thoroughly searched for barberry bushes. In this way not only bushes that were missed or overlooked in previous surveys are found, but many new ones that have grown from seeds or root fragments since the preliminary survey.

In a few regions where local rust epidemics have appeared it has been found advisable to make an intensive search for the source of infection. In each instance common barberry bushes have been found responsible for a large part of the losses caused by the black stem rust.

In all surveys, 27,415 bushes, sprouting bushes, and seedlings have been found on 1,535 properties. These figures do not include the bushes found while the campaign was under State supervision. It is estimated that 10,000

barberry bushes were destroyed in the first year or two prior to the final transfer of the administrative responsibility of the campaign to the United States Department of Agriculture.

### Summary of Activities, 1929

The activities of the past year may be considered in three separate divisions, viz., survey and eradication, education and publicity, and investigations.

#### Survey and Eradication

The survey of unfinished portions of Ward and Bottineau Counties was completed and more than half of Burke County was covered by the intensive method.

Because of local rust conditions in other areas of the State an intensive survey was made in three communities. In two of these, one in northern Burleigh County and the other covering parts of La Moure, Logan, Dickey, and McIntosh Counties, rather severe local rust epidemics occurred. Barberry bushes were found in every area except one in which the survey was made late in the season. Traill County also was surveyed because of the bushes found there last year, and additional bushes were found this year.

During the summer 711 bushes, seedlings, and sprouting bushes were found on 15 properties. Many of the bushes were bearing fruit.

Bushes were killed by an application of crushed rock salt whenever it was possible to do so without harm to near-by valuable shrubbery.

#### Education and Publicity

Each year greater stress is being laid upon educational and publicity activities, as the successful completion of the campaign depends largely upon the cooperation of the public. During the past year teachers in approximately one-third of the schools of the State were supplied with lesson plans and other literature, to aid them in teaching the subject of black stem rust control to their agricultural classes. Laboratory materials were supplied to several hundred schools. The campaign is indebted to the State Superintendent of Public Instruction and the county superintendents of schools for their splendid cooperation which has made this work so effective.

During the past year bulletins and circular letters were mailed to members of various cooperating organizations throughout North Dakota. Before the field agents entered a county during the past summer, circular letters announcing their arrival and the nature of their work were sent to property owners. Demonstrations on barberry eradication and black stem rust control were placed at 11 county fairs, while window displays and rust-spread demonstrations were used extensively.



FLOWERS  
(yellow)



BERRIES  
(bright red)

## Where Barberry Bushes Grow



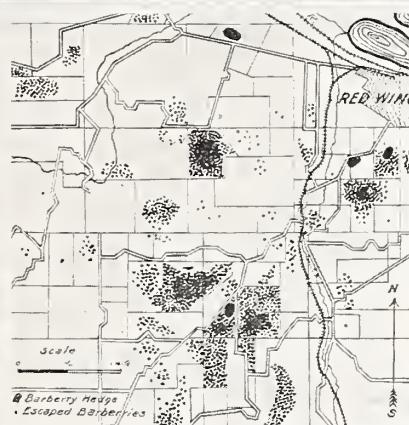
“IN DOORYARDS”



BIRDS CARRY BARBERRY SEEDS SEVERAL  
MILES, DROPPING THEM AMONG ROCKS  
AND IN OUT-OF-THE-WAY PLACES



“IN WOODLOTS”



ON ROCKY HILLSIDES



AS HEDGE FENCES

Barberries spread by birds



“UNDER OTHER”  
SHRUBS AND TREES





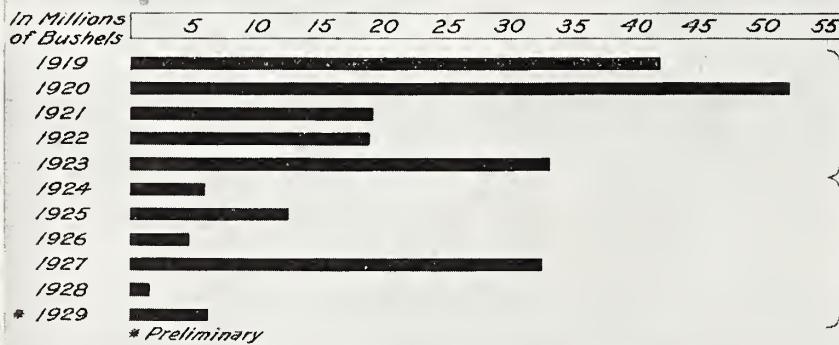
*Salting a bush*



*Sprouts from a dug bush*

## Common Salt Kills Barberry Bushes and Prevents Sprouting

### Wheat Losses in Barberry Eradication Area, 1919-1929



The average annual loss for the first five year period, 1919 to 1923, was approximately 33,000,000 bushels.

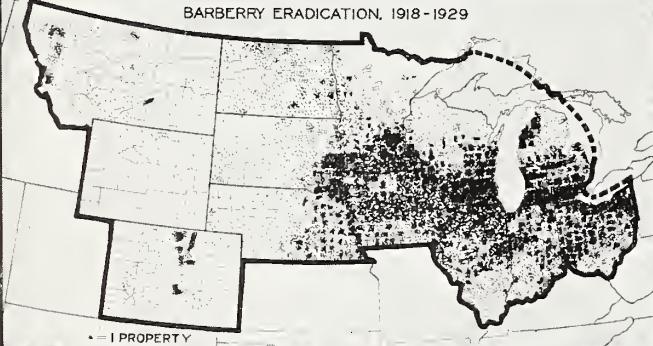
The average annual loss for the next six year period, 1924 to 1929, was approximately 10,500,000 bushels.

The losses to small grain crops caused by black stem rust have been reduced since the beginning of the barberry eradication campaign in 1918. The breeding of rust-resistant varieties, the use of early maturing varieties, and the sowing of crops early, have aided barberry eradication in this reduction.

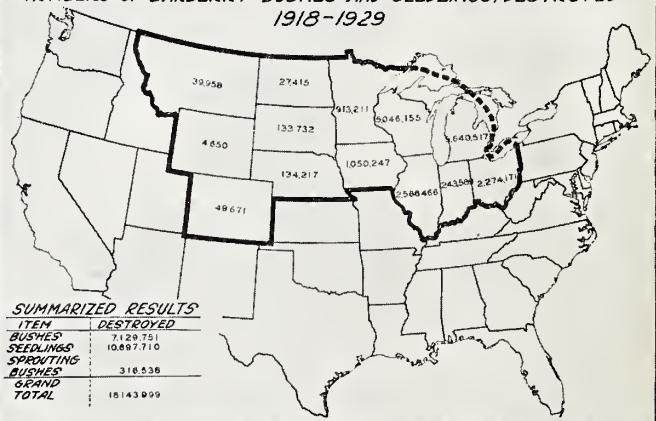
## “BARBERRY ERADICATION PAYS”

### RURAL PROPERTIES ON WHICH BARBERRY BUSHES WERE FOUND-ALL SURVEYS

BARBERRY ERADICATION, 1918-1929



### NUMBERS OF BARBERRY BUSHES AND SEEDLINGS DESTROYED 1918-1929



The public is kept informed of the progress of the work through news articles supplied to weekly and daily newspapers and press associations. A great part of the favorable public opinion throughout North Dakota is due to the cooperation of newspaper editors.

### Investigations

As in previous years, records were kept of the appearance of local stem-rust epidemics. In many cases these records led to the finding of barberry bushes overlooked during the survey.

Some cooperative research with the North Dakota Agricultural Experiment Station on the efficiency of dusting methods in controlling stem rust was undertaken on the Station plots during the past year.

Other experiments with the growth of seedlings under natural, environmental conditions are being conducted, from which it is hoped to gain more definite knowledge regarding the probability of escaped areas of barberry bushes in North Dakota.

### All Known Methods of Rust Control Must Be Employed

While barberry eradication is of first importance in the control of black stem rust, there are several methods known to be effective in lessening damage from this disease. Early sowing of grain, proper preparation of the seed bed, avoidance of low, poorly drained land, proper use of fertilizer, in fact anything that promotes early ripening, will help reduce the danger from rust.

Certain varieties of wheat, oats, and barley which are more disease resistant than others have been produced by plant breeders. Wherever these varieties meet the requirements of a given region and are desirable from the standpoints of yield, milling quality, and resistance to other cereal diseases, they should be substituted for the less satisfactory varieties.

### New Strains of Destructive Black Stem Rust Develop on the Common Barberry

The production of rust-resistant varieties of grains probably will be much more successful when all common barberry bushes have been eradicated. The reason for this is shown in the recent important discoveries made by the Canadian Rust Research Laboratories at Winnipeg and by E. C. Stakman and his coworkers at the University of Minnesota. Both of these groups, conducting independent research, have proved that entirely new strains of the destructive black stem rust are produced if two different forms of the rust crossbreed

on the barberry leaves. The certainty that new forms of the dangerous disease may appear suddenly, makes the eradication of the common barberry all the more imperative, since it is on the barberry alone that crossing can occur in nature. The new and apparently resistant varieties of grains are not safe with barberries near. If for no other reason than to protect the new kinds of super-wheat which are now in the process of being developed, all common barberry bushes must be destroyed.

#### Barberry Eradication Must Be Continued

Local stem-rust epidemics recurring this year demand that some areas be covered by the most intensive survey. While such work takes time, it has always proved its worth. The survey in Burke County during the past summer proved that there still are barberry bushes in western North Dakota. Heavily fruiting bushes, 38 years old, were found this year within a mile of the Missouri River, which would indicate the possible existence of an area of escaped bushes along the Missouri bottoms. Anyone familiar with this river can readily appreciate the problems that the survey of such a territory will present.

The task of eradicating barberry bushes must be continued. Were it to stop now, within a short while the remaining barberry bushes would propagate to such an extent that all the work done so far would be lost.

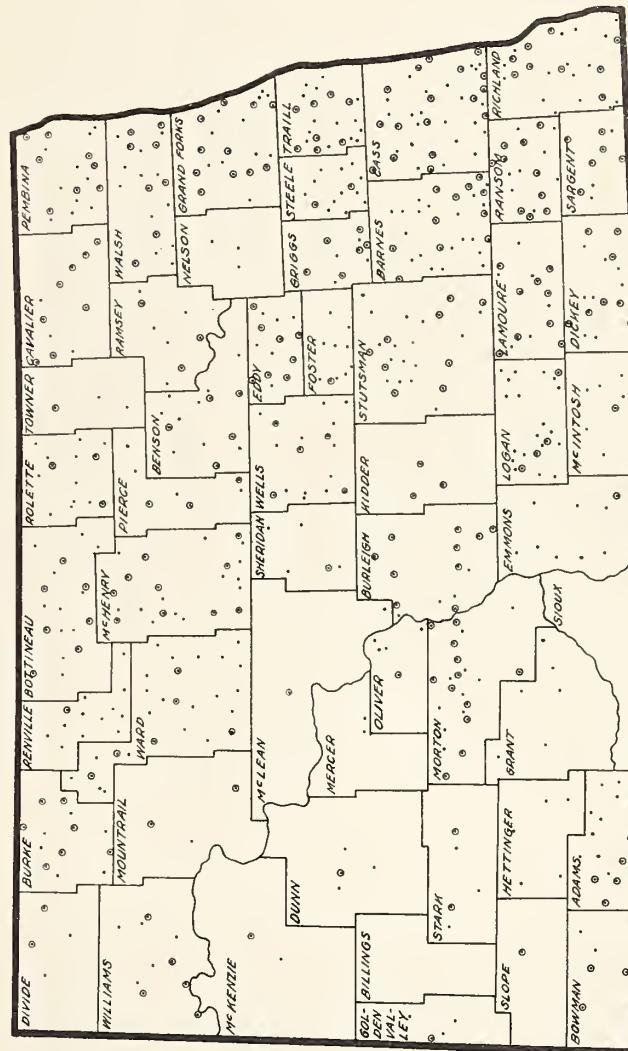
The past gives assurance for the future. The trend of losses due to black stem rust has steadily decreased during the period of the campaign in the course of which more than 27,000 barberry bushes have been destroyed in North Dakota, and more than 18,100,000 in the 13 States comprising the barberry eradication area.

Reduce Black Stem Rust Losses by Barberry Eradication. IT PAYS!

March, 1930.

# PROPERTIES HAVING BARBERRY BUSHES 1918-1929

## NORTH DAKOTA

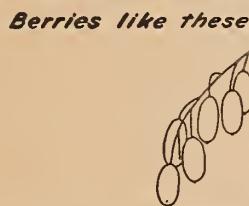
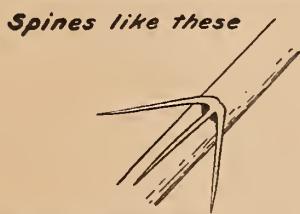
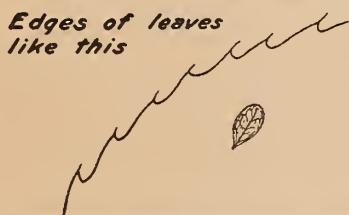


FARMS HAVING BARBERRY BUSHES  
TOWNS HAVING BARBERRY BUSHES



# Common Barberry Spreads Black Stem Rust

When you find  
a spiny bush  
with-



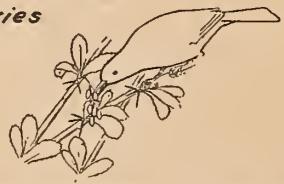
It is a  
**Common Barberry**  
and should be  
reported at once

## Know Common Barberry

## Look For It!

Spread of  
Barberries by  
birds

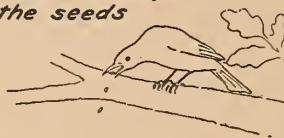
Birds eat the  
berries



Carry them to their  
roosting places



Where they cough  
up the seeds



From which seedling  
bushes grow



They in time  
bear fruit which  
is again carried  
farther on

## Look For and Report All Common Barberry Bushes

To the State Leader of Barberry Eradication, in care of your State Department  
of Agriculture or your State Agricultural College.

# Common Barberry Bushes

*spread*

## Black Stem Rust

*to*

WHEAT, OATS,  
BARLEY, RYE,  
*and Many Wild*  
Grasses

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